Environmentally Conscious Products -Transportation-Related Products-

In aerospace field, KHI Group contributes to the advancement of the world's aircraft by jointly developing and manufacturing with leading American and European enterprises. Our technologies are highly reputed in the world. Under the increasing demands for improvement of fuel efficiency, KHI Group has been developing the technologies for both aircraft bodies and engines. In shipbuilding field, KHI Group develops and builds a variety of products, such as LNG carriers and LPG carriers. In response to the demand for increased fuel efficiency, we are working to develop technologies for optimizing hull forms and increasing the efficiency of propulsion systems. In rolling stock field, KHI Group manufactures a wide range of products, for example Shinkansen bullet trains. As for environmental measures, KHI Group emphasizes improved energy efficiency in rolling stock as well as noise reduction and enhanced recyclability, drawing on the results of technological teamwork with customers as well as our own technologies.

1 First Delivery of "Boeing 787 Dreamliner"

Low Fuel Consumption

Low noise

Right from the start, KHI was involved in the joint development of the "Boeing 787 Dreamliner" as a member of the international team, assigned with the task of developing the forward fuselage—a key component—and the fixed section of the wing trailing edge. With an innovative airframe using lightweight, high-strength carbon fiber composite for the fuselage and wings, this aircraft is about 20% more fuel efficient than comparable aircraft and cuts operating costs by about 30%. Greater use of composite materials, which boast excellent strength and anticorrosive qualities, facilitates better control of the on-board environment, including air pressure and humidity, which ensure a more comfortable flight for passengers. KHI also played a role in the development and production of the "Trent 1000 engine" for Rolls-Royce. This engine, which boasts low fuel consumption and low noise, powers the "787".

The first delivery of the 787 was to All Nippon Airways Co., Ltd.—the first customer (first order)- in September 2011, but the aircraft has captured the interest of airlines around the world and this is sure to make it a best seller.

The "Boeing 787 Dreamliner"

2 Development of New-Model LNG Carrier
—Inaugural Installation of Advanced Reheat Steam Turbine Plant Cuts Fuel Costs 15%

Low Fuel Consumption

The 177,000m^3-capacity KHI-built LNG carrier "Energy Horizon" expands 20% more tank capacity than its predecessors, thanks to the installation of the largest Moss* tanks ever fitted into an LNG carrier. Yet the carrier still maintains the ability to enter at the world's major LNG loading and receiving terminals. In addition to development work on hull size and shape, KHI endeavored to optimize propulsion performance, and while the ship is wider than existing carriers, it moves through the water with the same performance level.

Furthermore, the "Energy Horizon" is equipped with the world's first reheated steam turbine propulsion plant for LNG carrier, wherein steam used to drive the high-pressure turbine is returned to the boiler where it is reheated, with the resulting steam driving an intermediate-pressure turbine. This delivers a 15% improvement in fuel efficiency over conventional steam turbine propulsion plants and marks the first successful development of a new steam turbine plant for LNG carriers in about 35 years.

*The Moss independent, spherical tank design was developed by Norways' Moss Rosenberg (now, Moss Maritime).

The "Energy Horizon"

3 Production of New-Model Train "Series 13000"
—Takes Environmentally-Friendly, Barrier-Free Safety to New Heights

Energy conservation

Low noise

The "Series 13000" commuter train delivered to Keihan Electric Railway Co., Ltd., uses about 35% less electric power than the series it replaced, because of its semi-double skin aluminum body, which helps to reduce weight, and its variable-voltage, variable-frequency (VVVF) control which enables the power generated by the car during braking to be returned to the power supply system. The use of low-noise equipment also contributes to a quieter environment along the tracks.

In addition, these cars have more barrier-free features, including spaces for wheelchairs, LCD passenger information screens above doorways, measures for safe passage between cars, guidance chimes, door open/close indicator lamps, low-height luggage racks and bright orange lines marking the edges of the car doorways.

Structural strength was increased with the aim of further enhancing safety, including crash resistance, and measures were taken to prevent injuries to passengers in the event of emergency braking or collision.

The "Series 13000" commuter car for Keihan Electric Railway, Co., Ltd.

Environmentally Conscious Products -Industrial Plant and Equipment-

KHI Group is offering around the world a variety of products that support the foundations of industry, including, large-scale plants for cement, chemicals and nonferrous metals, and industrial equipment such as steam turbines, aerodynamic machinery and other prime movers, as well as industrial robots, hydraulic equipment, and other civil engineering machinery.
The field of plant and industrial equipment constantly requires not only high performance but also lesser environmental impact, such as energy and resource conservation and more compact sizing. KHI Group continues to develop new products with advanced technologies to meet these needs.

4 New" K7V Hydraulic Pump"—Shorter Overall Length, Reduced Weight

KHI develops and manufactures pumps as well as motors and a variety of valves for hydraulic shovels. The "K7V" is an environment-friendly hydraulic pump that reflects efforts to meet recent market demand for pumps that are more compact and deliver higher performance, through newly designed rotary components, including pistons and cylinders, which are core parts, and also reflects our commitment to make components more lightweight and to reduce the number of machining points. Compared with the "K3V", another Kawasaki-brand pump, the "K7V" is 13% shorter in overall length and an average 3 dB quieter. It boasts higher efficiency, up 1.5 points, and its bearing life is 68% longer for extended product life. In addition, the compact size led to a 7% reduction in the amount of materials used to build the "K7V". Consequently, the "K7V" contributes to lower environmental impact. We will continue to pursue improvements that limit environmental impact still further.

The " K7V Hydraulic Pump"

Resource saving

Energy conser-vation

5 Debut of "BX Series" Spot-Welding Robots

The "BX series" features vertical, articulated robots optimized for spot welding automobile bodies and components. This series takes the excellent performance of the "Z series" of existing, large, general-purpose robots, to the next level. With their lightweight arms, small, high-output, high-revolution motors and the latest in antivibration control technology, "BX series" robots achieve a cycle time about 25% faster than equivalent models already on the market. In addition, the arm features a hollow section to accommodate the cable harnesses of a welding gun, thereby obviating the need to allow for possible interference with adjacent robots or peripheral equipment. We also designed a compact body, which in conjunction with the in-arm harness housing feature, gives the "BX series" robots a footprint just half that of conventional models, and facilitates higher density installation.

"BX Series" Spot-Welding Robots

Resource saving

Energy conser-vation

6 Debut of "ESJ Model" Static Classifier-Equipped Opposed Jet Mill

KHI Group has a lineup of fluidized bed opposed jet mills with high grinding performance and easy-to-execute particle size adjustment. The new model augments the high grinding performance of its predecessors with a newly developed static classifier that works without the aid of any mechanical drive. Pressurized air is forced into the mill at the bottom in three directions at about 7 atm, causing particles to collide with each other inside these jets of air and thereby pulverizing the subject material. The mill structure is simple and the size is compact, facilitating disassembly, reassembly and maintenance. Also, the amount of compressed air used by this jet mill is roughly 20% less than that used by conventional jet mills with a classifier rotor.
The "ESJ Model" is ideal for use in the battery and pharmaceutical industries where processing small amounts of various types of materials requires frequent cleaning and washing of the equipment and for pulverizing materials that must be free of foreign particles and impurities. The Model is also ideal for R&D applications.

Jet Mill "ESJ Model"

EarthTechnica Co., Ltd.

Resource saving

Energy conser-vation